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ABSTRACT

Teacher reinforcement of indoor play equipment utilization was employed as a procedure to increase the peer social interaction of an asocial four-year-old female child. Touching peers, using peers' names, verbalizations, solitary or parallel manipulation, cooperative construction, and cooperative thematic play were dependent variables. Treatment phases were effective in increasing the behaviors with an accompanying reduction in the child's duration of solitary or parallel manipulation. Reinforced play intervention appears to be an effective means of increasing social interaction among preschoolers. (Author/BEF)

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PLAY EQUIPMENT UTILIZATION AND ITS EFFECTS ON PEER SOCIAL INTERACTION FOR AN ASOCIAL 4-YEAR-OLD FEMALE SUBJECT

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Abstract

Teacher reinforcement of indoor play equipment utilization was employed as a procedure to increase an asocial four-year-old female S's social interaction with peers. Touching peers, using peers' names, verbalizations, solitary or parallel manipulation. cooperative construction and cooperative thematic play were the dependent variables. The treatment phases were effective in increasing the behaviors with an accompanying reduction in the S's duration of solitary or parallel manipulation. The results suggest that a reinforced play intervention is an effective means of increasing social interaction among preschoolers.

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PLAY EQUIPMENT UTILIZATION AND ITS EFFECTS
ON PEER SOCIAL INTERACTION FOR AN
ASOCIAL 4-YEAR-OLD FEMALE SUBJECT

The value of thematic play experiences for enhancing the intellectual and emotional growth of young children has been explicated by Almy (1966), Herron and Sutton-Smith (1971), Leiberman (1965), Curry (1974), Sutton-Smith (1971a), Vygotsky (1967), Athey (1974), Berlyne (1968), Biber (1968), Hunt (1968), and Wolfgang (1974). Kritchevsky (1969) and Wolfgang (1977) have discussed procedures for structuring the young child's play environment as a means for stimulating interpersonal interchange with peers and for encouraging more complex levels of play equipment utilization.

Several behavioral procedures have been used to increase the interpersonal concomitants of peer social interaction through the medium of play. Keogh (1973) employed teacher priming and the presence of gross motor play equipment to increase the levels and duration of appropriate social interactions of a 2-1/2-year-old male. Levison (1971) paired children who dispensed social rewards at a relatively high rate with children who received and dispensed rewards at a low rate to increase verbalizations and cooperative play. Shores (1976) used active teacher involvement and teacher structured free-play to ameliorate social interaction deficits among young behaviorally handicapped children. Buell (1968) used priming techniques in order to accelerate play equipment utilization. Other researchers (Holmberg, 1972; Patterson, 1976; Brenner, 1976) have likewise utilized behavioral procedures to investigate the relationship between social interaction and play experiences among young children.

METHOD

Subject and Setting

The S was a four-year-old female attending the Child Study Center at East Tennessee State University. Her teachers noted that she did not participate in activity centers with her peers. Specifically the S did not talk to peers, touch peers, or engage in cooperative play activities.

The Child Study Center is a self-contained preschool facility for family-grouped four- and five-year-olds. Two certified early childhood teachers assisted by two student teachers were responsible for the operation of the program. Accessible for use by the staff and 35 children were one large learning area divided into activity centers for small group use, and an adjacent standard sized classroom designed for use by eight to twelve children.

The experiment took place during the daily one-hour free choice period during which the children were encouraged to participate in at least two different learning centers. Equipment in the experimental classroom included several sets of large building blocks, two large interlocking plastic climbing cubes, two large rocking "boats," a multi-unit climbing frame (removed in a later phase), several chairs, and a varied assortment of life-sized dress-up and housekeeping props.

Design

It was assumed that an increase in the S's play equipment utilization in close proximity with other children would vicariously reinforce (her) interaction with peers (Keogh and others, 1973). While in the playroom, the duration of time engaged in solitary or parallel manipulation, cooperative construction, and cooperative thematic play by the S was recorded. In order to accurately determine the socialization effects

of play, the number of times the S touched peers, used peers' names, and verbalized were recorded.

Definitions

Solitary or Parallel Manipulation - behavior characterized essentially by interactions with the environment by an individual performing excusively alone or, if in near proximity to another, with regard to strict egocentric disposition in terms of utilization of materials, thematic content, and verbalization.

Cooperative Construction - product-oriented behavior characterized by an individual's reliance on the assistance of at least one other person in the creation process or in the process of defining and elaborating upon anticipated utilization of environmental resources.

Cooperative Thematic Play - behavior in which an individual transforms himself (in pretend play) to be a person or object other than himself as indicated by his verbal and/or motoric enactment of his perception of that role. In addition, modes of interpersonal transaction are demonstrated by the individual's awareness of, empathy for, and accommodation to at least one other person in a fashion of give-and take in a make-believe situation (Curry, 1974, pp. 274, 276).

Verbalization - verbalization within three feet of a child or teacher.

Touching - physical contact between S and peers initiated by the S.

Using Names - S's use of individuals' formal names, titles, nicknames in a reality or make-believe situation.

Procedure

Each day the S together with six to eight agemates was accompanied to the playroom by one of the teachers and an experimenter. Opportunities for observation were constrained by the teacher's concern that all children

participate in the thematic play activity. Therefore, daily periods of observation were variable in length.

Baseline I

Baseline data were collected on the S's play behaviors.

Teacher Prime

While the S was in the playroom, the teacher primed the S's use of play equipment and provided social reinforcement contingent upon use of play equipment. Priming consisted of leading the S to the play equipment and placing her on that equipment in the presence of peers. Priming also constituted the solicitation of the S's help in arranging play materials, as well as questioning tactics.

Playmate Selection

A sociometric test was administered to the S. All peers in the playroom environment during observation were selected on the basis of the S's sociometric preferences. Equipment for physical exercise was removed, and materials central to homemaking activities were added to the playroom. Teacher initiated priming and social reinforcement were continued as in the previous phase.

Peer Prime

This phase was characterized by peer initiated priming and reinforcement. Prior to each experimental session, peer playmates were informed by the teacher that they would receive a surprise at the end of the play period if the S participated in the play activities. The surprise consisted of a different snack each day such as: donuts, hot chocolate, cider, cookies, and oranges. Playmates and play equipment remained the same as in the previous phase. Teacher initiated priming and social reinforcement were terminated.

Extinction

Following Christmas vacation, data were collected on the S's play behaviors in the absence of experimenter manipulation.

Results

Reliability data were collected for all behaviors during each phase of the experiment. Percent of observer agreement was calculated using the formula:

$$\text{Percent Agreement} = \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100-$$

The average reliability for all behaviors follows: verbalizations, 96%; touching, 100%; names, 100%; solitary or parallel manipulation, 92%; cooperative construction, 92%; cooperative thematic play, 91%.

Figure 1 illustrates the frequencies of the S's verbalizations. During Baseline, frequency of verbalizations did not exceed .133, and on occasion was at the record floor. Noticeable increases in frequency of verbalizations were demonstrated during each of the subsequent treatment phases. The frequency of verbalizations ranged from .778 to 2. 3 during one treatment (Teacher Prime phase). The Playmate Selection phase of the treatment revealed a frequency range of .842 to 3.77 for verbalizations. During the Peer Prime phase of the treatment, the frequency of verbalizations reached a high of 6.27 and dropped no lower than 2.85. Extinction data shows an initial increase in verbalization frequency after a step-down from treatment, from .39 to 1.6 and then a sharp deceleration effect to a level of zero during the recording period.

Frequency of touching peers is represented in Figure 2. Frequencies of this behavior remained below or at the record floor during Baseline. Beginning with the Teacher Prime phase of the treatment during which the

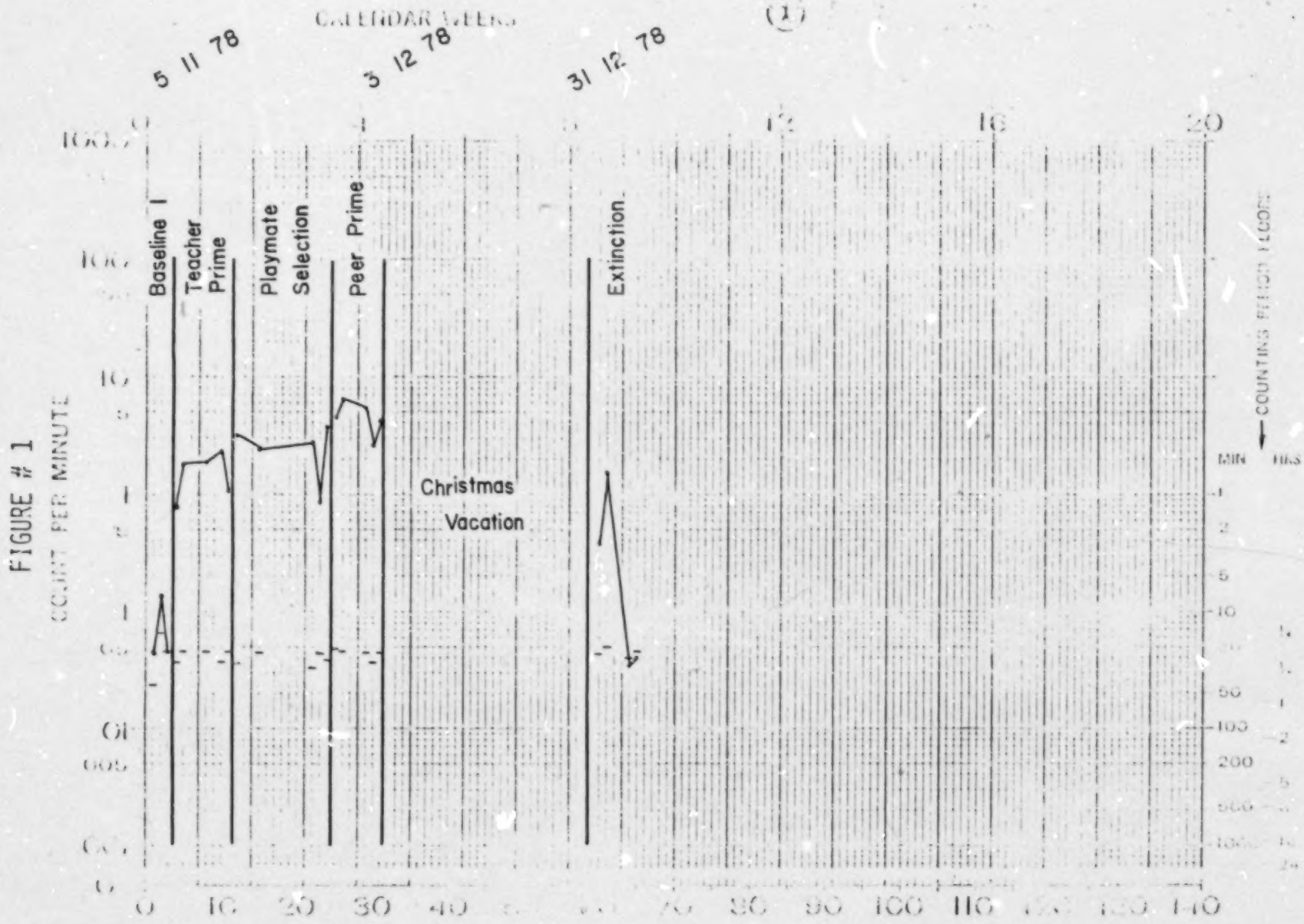
FIGURE # 1
COUNT PER MINUTE
CALENDAR WEEKS
5 11 78
3 12 78
31 12 78
Baseline I
Teacher Prime
Playmate Selection
Peer Prime
Extinction
Christmas Vacation
COUNTING PERIOD RECORD
MIN
HRS
SUCCESSIVE CALENDAR DAYS
0 10 20 30 40 80 90 100 110 120 140
R Spangler
P Wishon
L Keller
Nikki
4
Student Verbalizations
ETSU Child Study Center
R Bower
R Bower
R Bower
Frequency

frequency of touching peers ranged from .0435 (record floor) to .148, the data shows an acceleration trend across treatment phases. During the final treatment phase (Peer Prime), touching behavior accelerated with frequencies ranging from .19 to .5. Deceleration to a level consistent with Baseline can be noted during extinction. Frequency range for this period varied from a high of .1 to zero during the recording period.

The frequency of using peers' names in conversation is illustrated in Figure 3. Frequency levels for this behavior remained below the record floor throughout Baseline. Frequency of name-using behavior was sporadic during Teacher Prime and Playmate Selection treatment phases, as levels of this activity ranged from zero for the recording period to .105. An acceleration trend can be noted at the end of Playmate Selection. A sustained increase in the frequency of using peers' names is observable in the Peer Prime phase. The initial frequency observed was at .043 (record floor). From there it accelerated to .273 and was maintained above .174 throughout the remainder of Peer Prime. Extinction data reveals a deceleration to zero.

When interpreting a duration chart, trends have an opposite appearance. One must interpret a deceleration as an increase in the target behavior. (Cooperative Thematic Play) and an acceleration as a decrease in the target behavior.

It was the objective of the experimenter to accelerate and maintain the S's duration of on task solitary parallel manipulation to a level above the criterion line. At the same time, it was hoped that S's on task duration of cooperative thematic play would substantially decelerate from baseline levels above the criterion line.

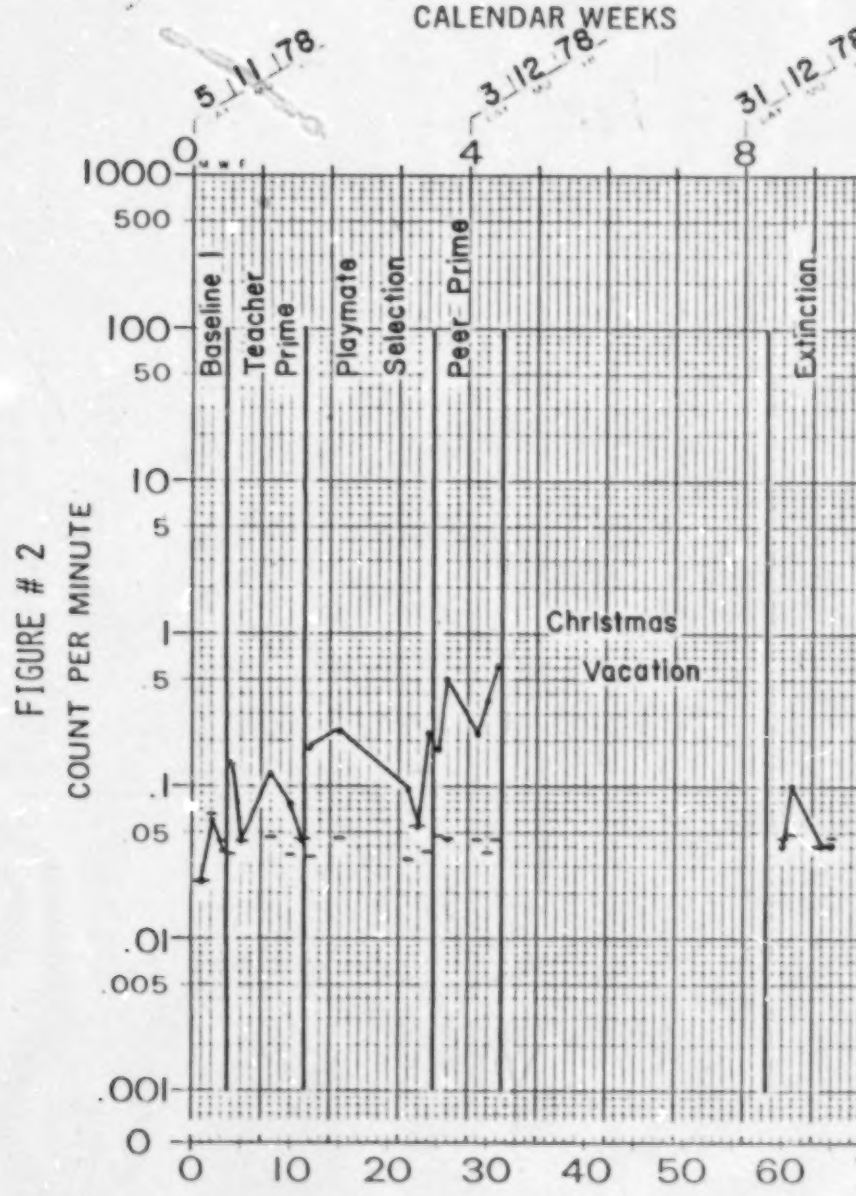

FIGURE # 2

R Spangler P Wishon L Keller
SUPERVISOR ADVISER MANAGER

ETSU Child Study Center R Bower
DEPOSITOR AGENCY

DAILY BEHAVIOR CHART (DC 3EN)
6 CYCLE - 140 DAYS (20 WKS)
BEHAVIOR RESEARCH CO
BOX 3351 - KANSAS CITY, KANS. 66103

12 16 20

COUNTING PERIOD FLOORS

MIN HRS

1
2
5
10 —¼
20 —½
50 —1
100 —2
200 —5
500 —8
1000 —16
—24

70 80 90 100 110 120 130 140

ENDAR DAYS

Nikki (BEHAVER) 4 (AGE) Student (LABEL) Touching Peers (COUNTED)

R Bower (COUNTER) R Bower (CHARTER) Frequency 12

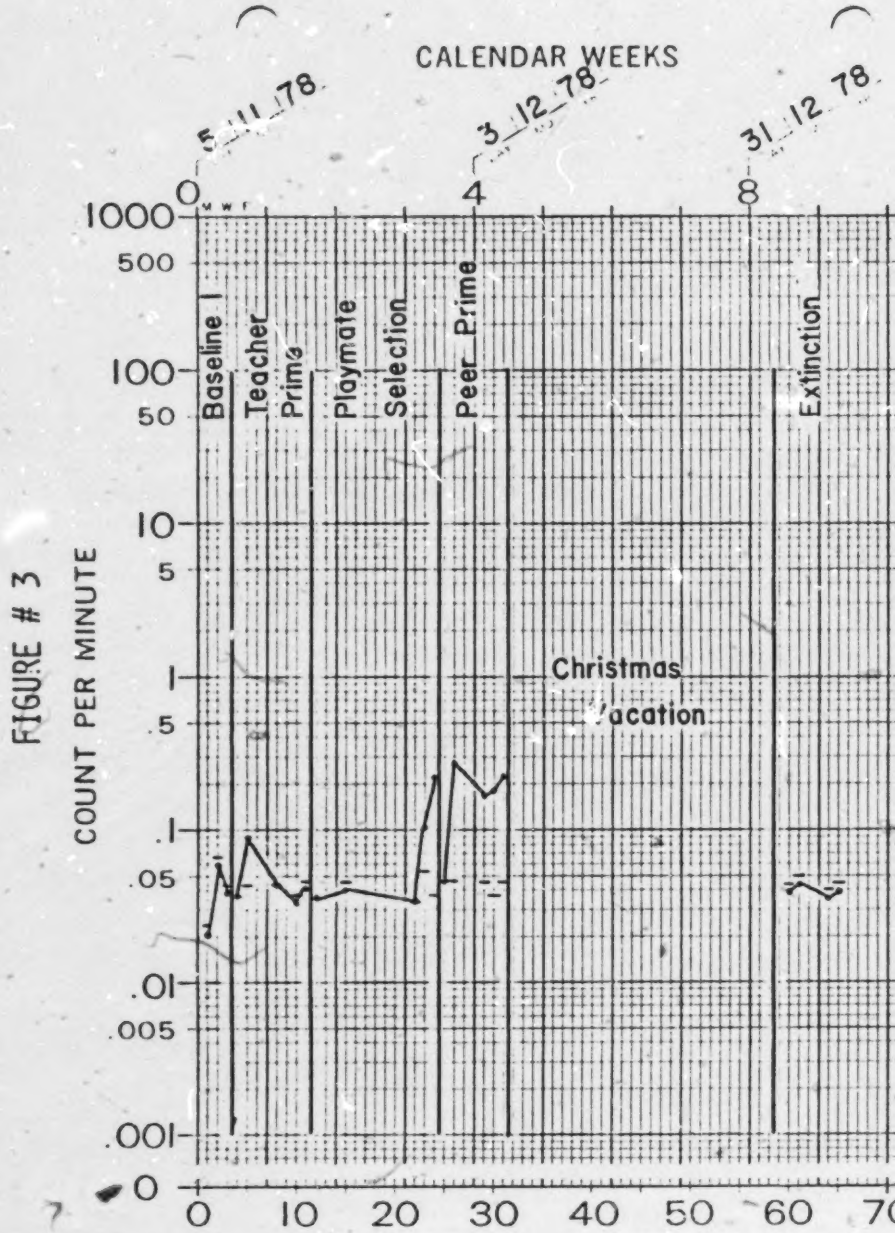

FIGURE # 3

R Spangler P Wishon L Keller
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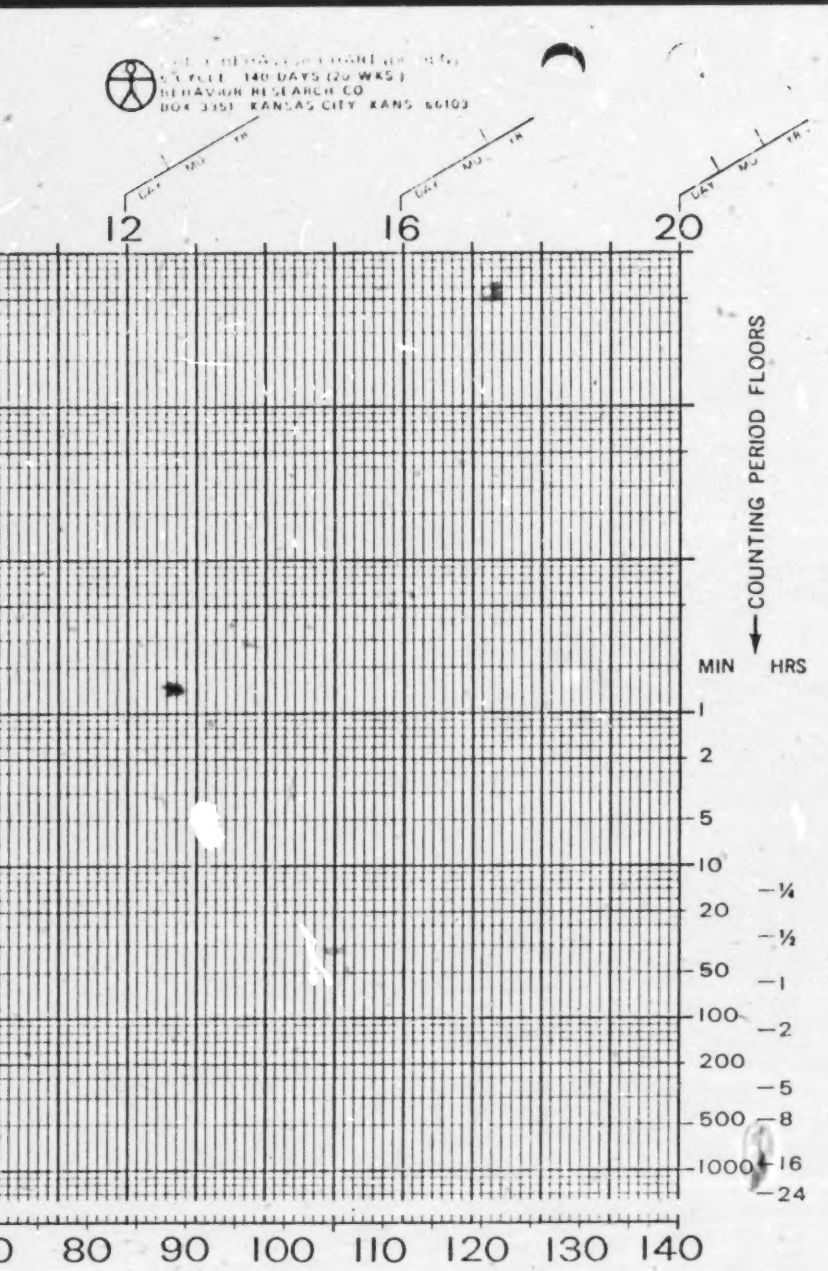
ETSU Child Study Center R Bower R
DEPOSITOR AGENCY



DAR DAYS

Nikki | 4 | Student | Peers' Names

BEHAVER | AGE | LABEL | COUNTED

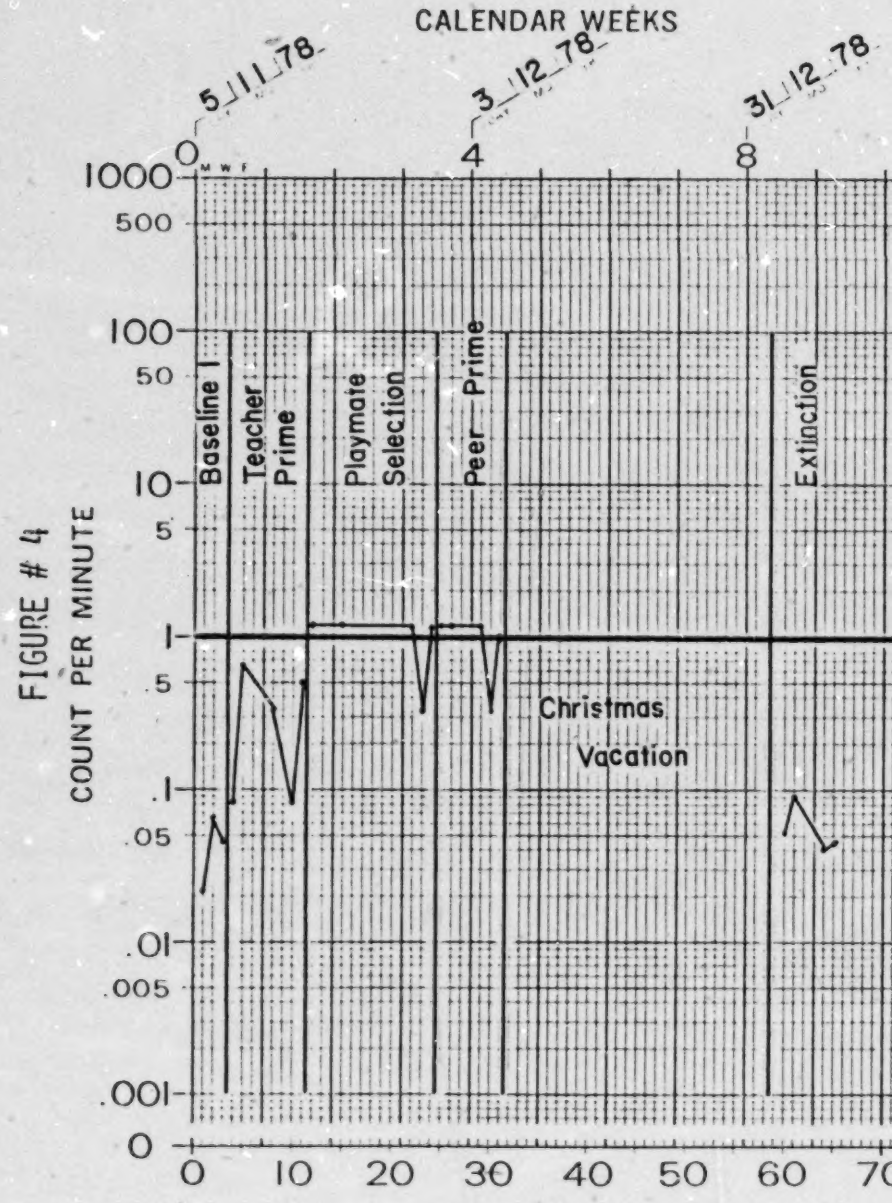
Bower | R Bower | Frequency

COUNTER | CHARTER

Duration on task with respect to S's solitary or parallel manipulation is depicted in Figure 4. During Baseline, the duration on task of solitary or parallel manipulative activity ranged from .023 to .048. During the subsequent treatment phases, a consistent deceleration trend of solitary or parallel manipulation can be noted. On task duration fluctuated somewhat during Teacher Prime; but during Playmate Selection and Peer Prime phases of the treatment, duration remained fairly stable above the criterion line, departing only twice to a level of .33. During extinction, a reversal trend manifest during which on task duration of solitary or parallel manipulation ranged from .04 to .09.

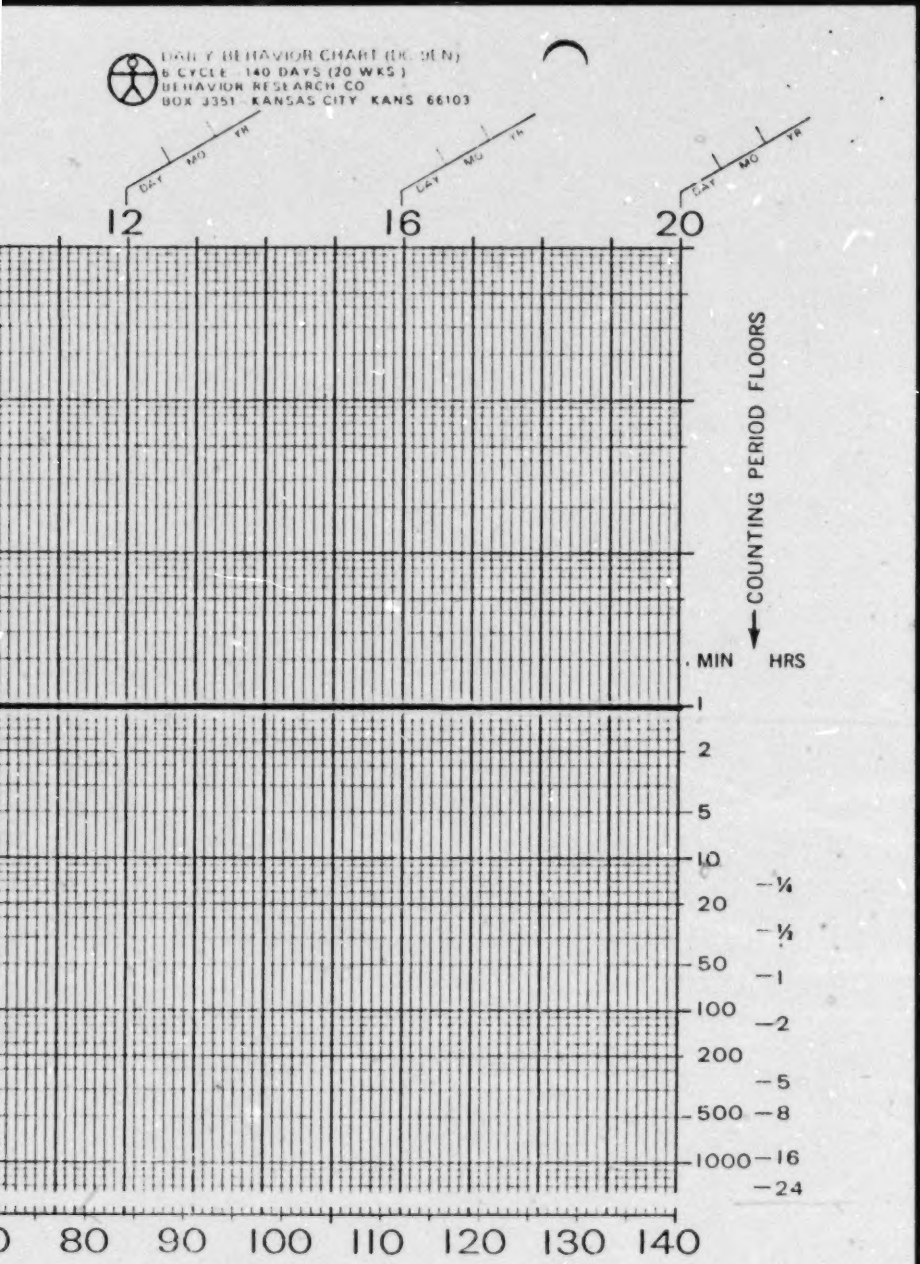
Figure 5 illustrates duration off task of S's solitary or parallel manipulation. Observed duration episodes off task were confined to levels which ranged from above the criterion line to .33. Beginning with the Teacher Prime phase of the treatment during which the duration of solitary or parallel manipulative activity ranged from .047 to .066, the data shows a steady profile at a decelerated level across treatment phases. Observed duration levels throughout the latter two treatment phases were characterized by little variability with recorded ranges of .032 to .0625. Extinction data reveals an acceleration trend as the duration of solitary or parallel manipulation ranged from .11 to 1.1 (above the criterion line).

On task duration of cooperative construction is represented in Figure 6. Observed levels of on task duration of S's cooperative construction ranged from above the criterion line to .33 during Baseline. Following an initial deceleration of on task duration to a level of .047 during Teacher Prime phase of the treatment, on task duration manifest



R Spangler P Wishon L Keller
SUPERVISOR ADVISER MANAGER

DEPOSITOR ETSU Child Study Center AGENCY R Bower OBSER R



Solitary or Parallel

DAR DAYS

Nikki 4 Student Manipulation
BEHAVER AGE LABEL COUNTED

Bower R Bower Duration: On Task
COUNTER OBSERVER

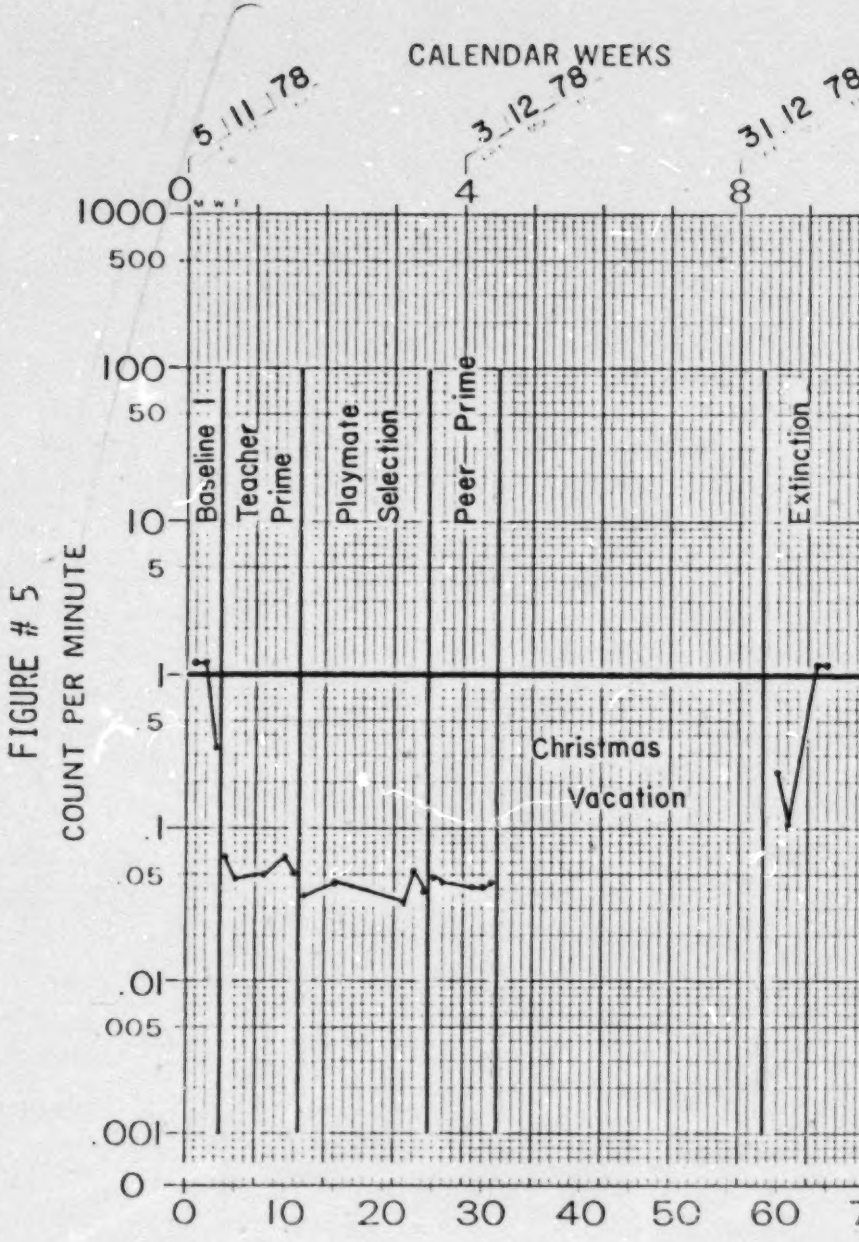


FIGURE # 5

R Spangler P Wishon L Keller

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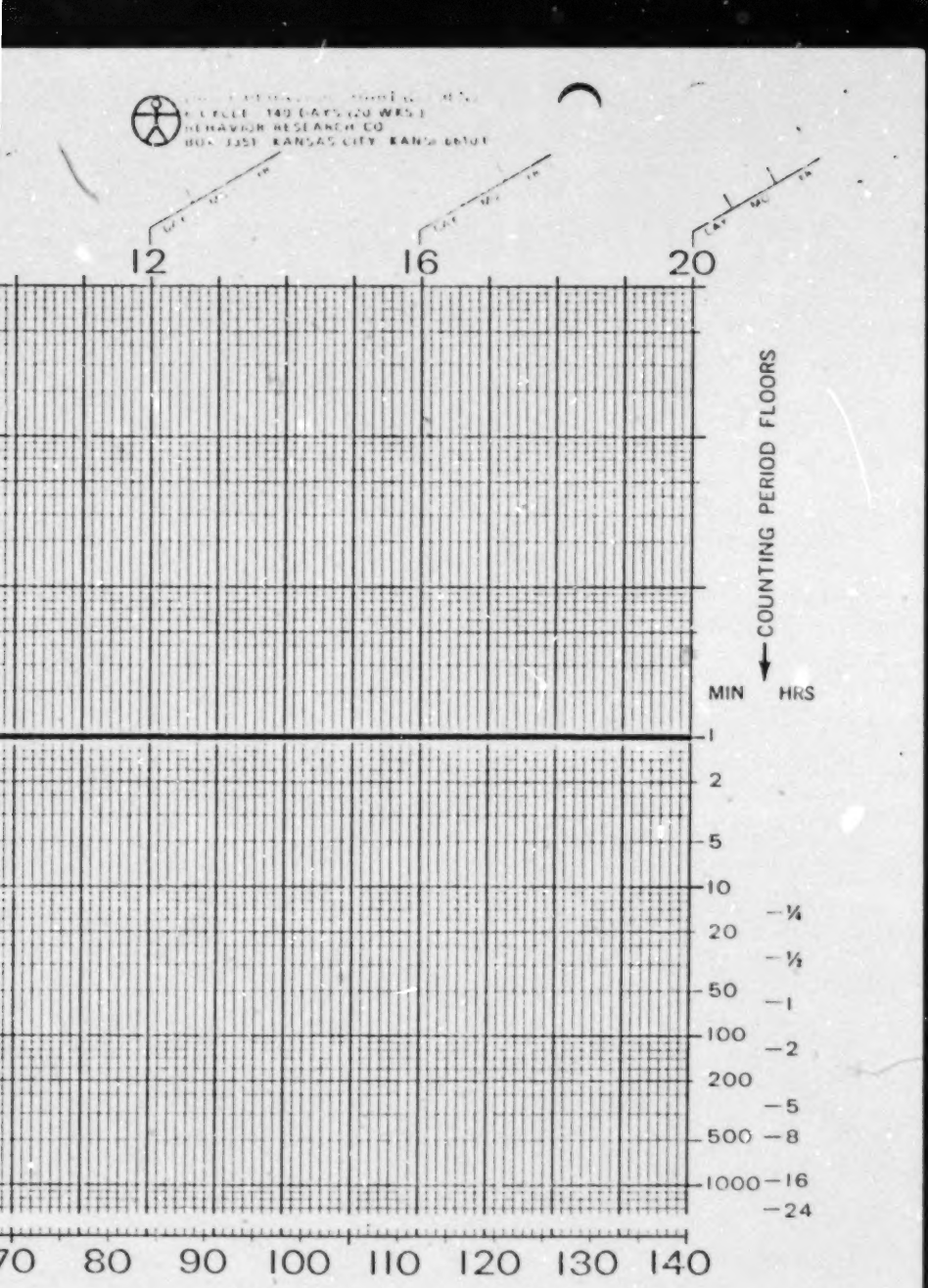
ETSU Child Study Center R Bower

DEPOSITOR AGENCY TIMER

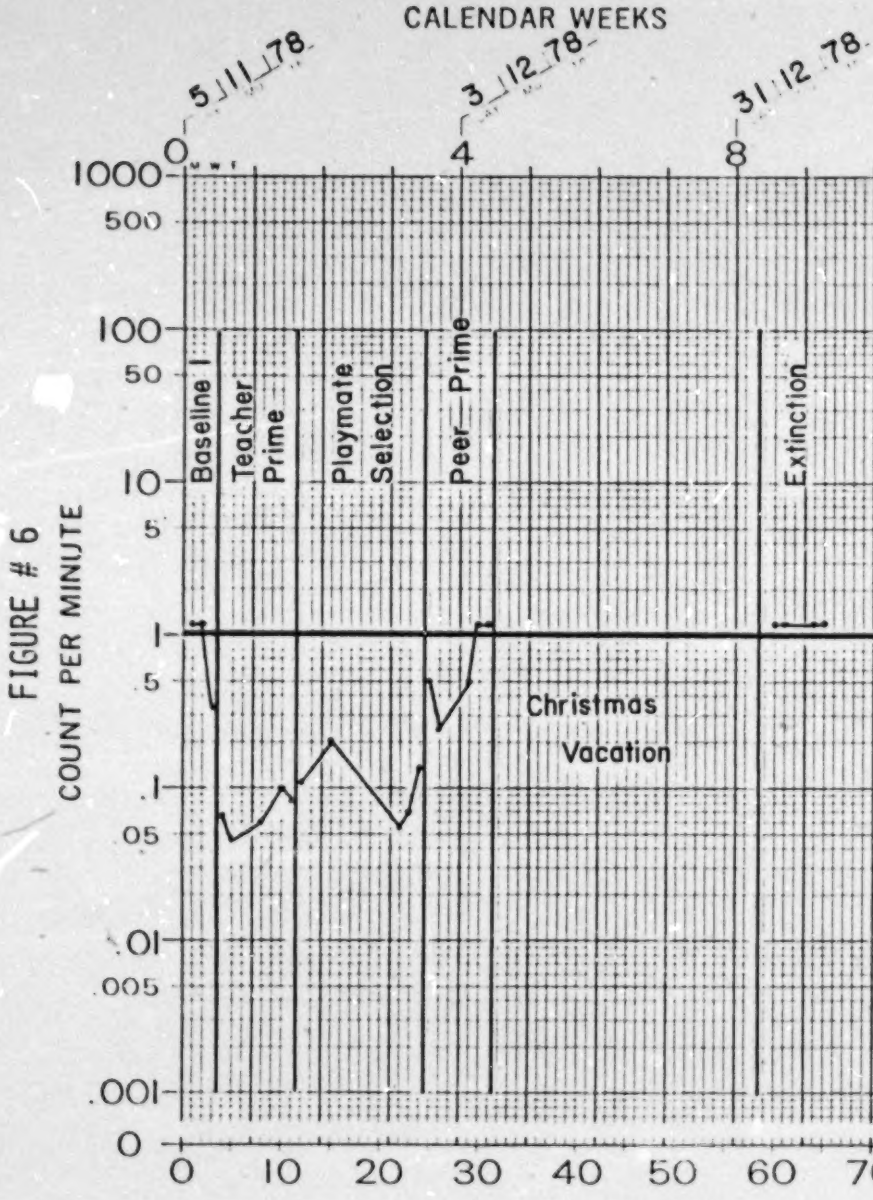


NDAR DAYS

Nikki 4 Student Solitary or Parallel
BEHAVER AGE LABEL Manipulation
COUNTED

R Bower R Bower Duration: Off Task
OBSERVER CHARTER

9



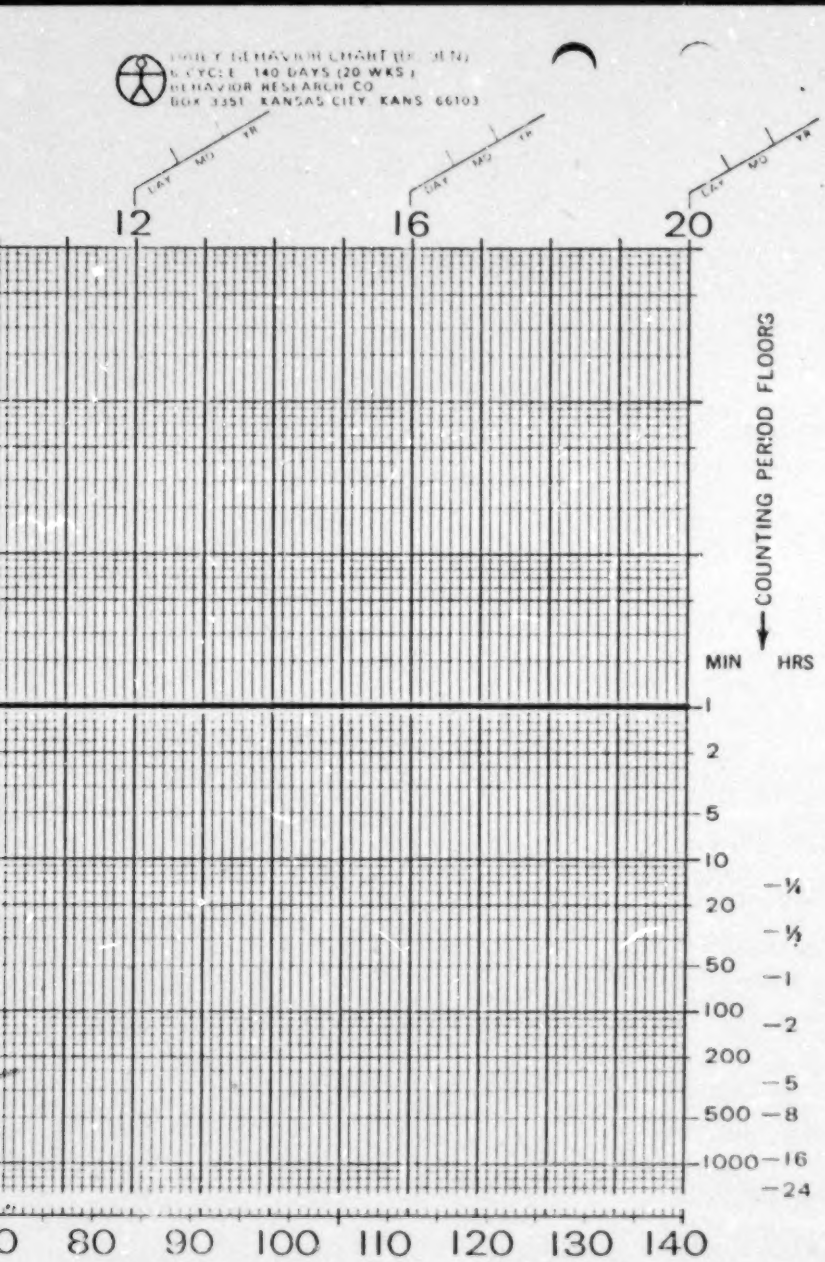
R Spangler P Wishon L Keller SUCCESSIVE CALEN

SUPERVISOR ADVISER MANAGER

ETSU Child Study Center R Bower R

DEPOSITOR AGENCY

20



IDAR DAYS

Nikki BEHAVER | 4 AGE | Student LABEL | Cooperative Construction COUNTED

Bower COUNTER | R Bower CHARTER | Duration: On Task

an acceleration trend reaching a high of .22 during Playmate Selection treatment phase. From that point on task duration of cooperative construction dropped to a level of .055 during the next observational event. Throughout the remainder of Playmate Selection and Peer Prime treatment phases, on task duration accelerated steadily reaching a final level above the criterion line. Throughout Extinction, on task duration of cooperative construction remained above the criterion line.

Duration off task of cooperative construction is illustrated in Figure 7. During Baseline, off task duration of this activity ranged from .023 to .06. Duration off task of cooperative construction was unsteady and variable during Teacher Prime and Playmate Selection treatment phases as duration levels ranged from .053 to .66. A deceleration trend can be noted at the termination of Playmate Selection phase of the treatment. Off task duration levels were maintained at the decelerated level profiling little variance with a range of .038 to .055. Little change in off task duration of cooperative construction was manifest during Extinction as duration levels ranged from .04 to .05.

Figure 8 depicts on task duration of S's cooperative thematic play. Duration of on task cooperative thematic play remained constant above the criterion line throughout Baseline. From this level, on task duration steadily decelerated during the Teacher Prime phase of the treatment to a level of .125. The deceleration trend of on task duration continued during the Playmate Selection and Peer Prime treatment phases. With the exception of one observation during which on task duration of cooperative thematic play rose to a level of .5, on task duration levels during the latter two treatment phases ranged from .043 to .077. Extinction data reveals an acceleration trend for on task duration of cooperative

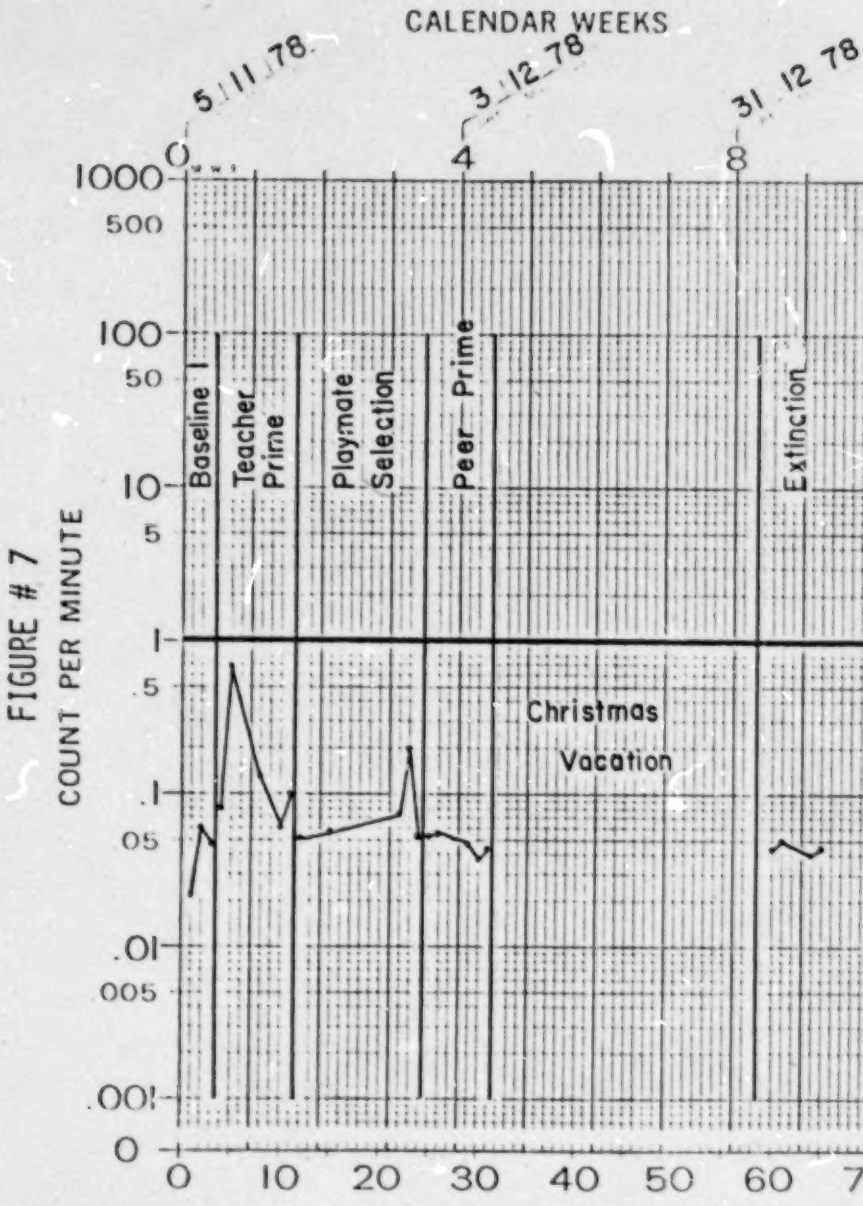


FIGURE # 7

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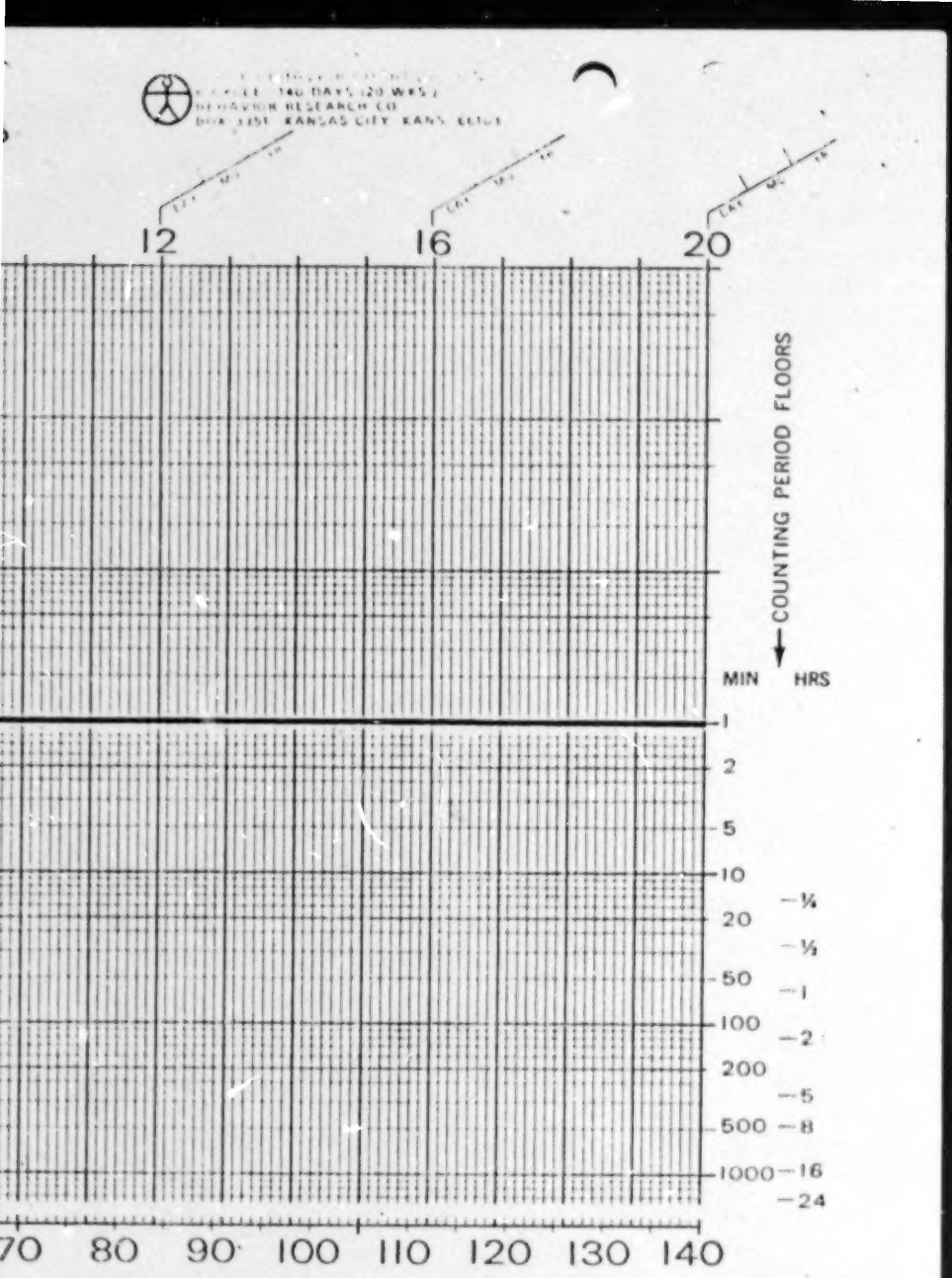
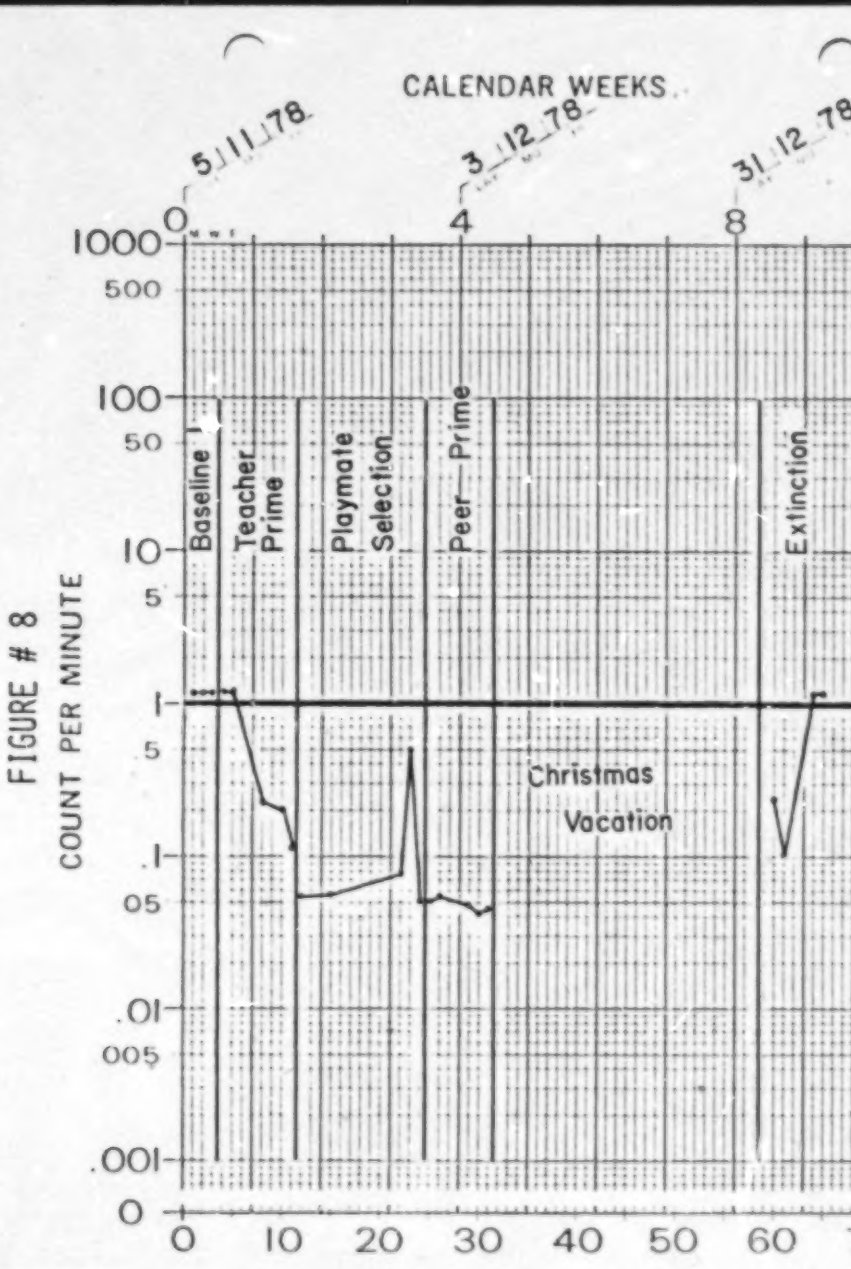
DEPOSITOR AGENCY



ENDAR DAYS

Nikki — BEHAVER | 4 — AGE | Student — LABEL | Cooperative Construction — COUNTED

R Bower — COUNTER | R Bower — CHARTER | Duration: Off Task



R Spangler P Wishon L Keller SUCCESSIVE CALE

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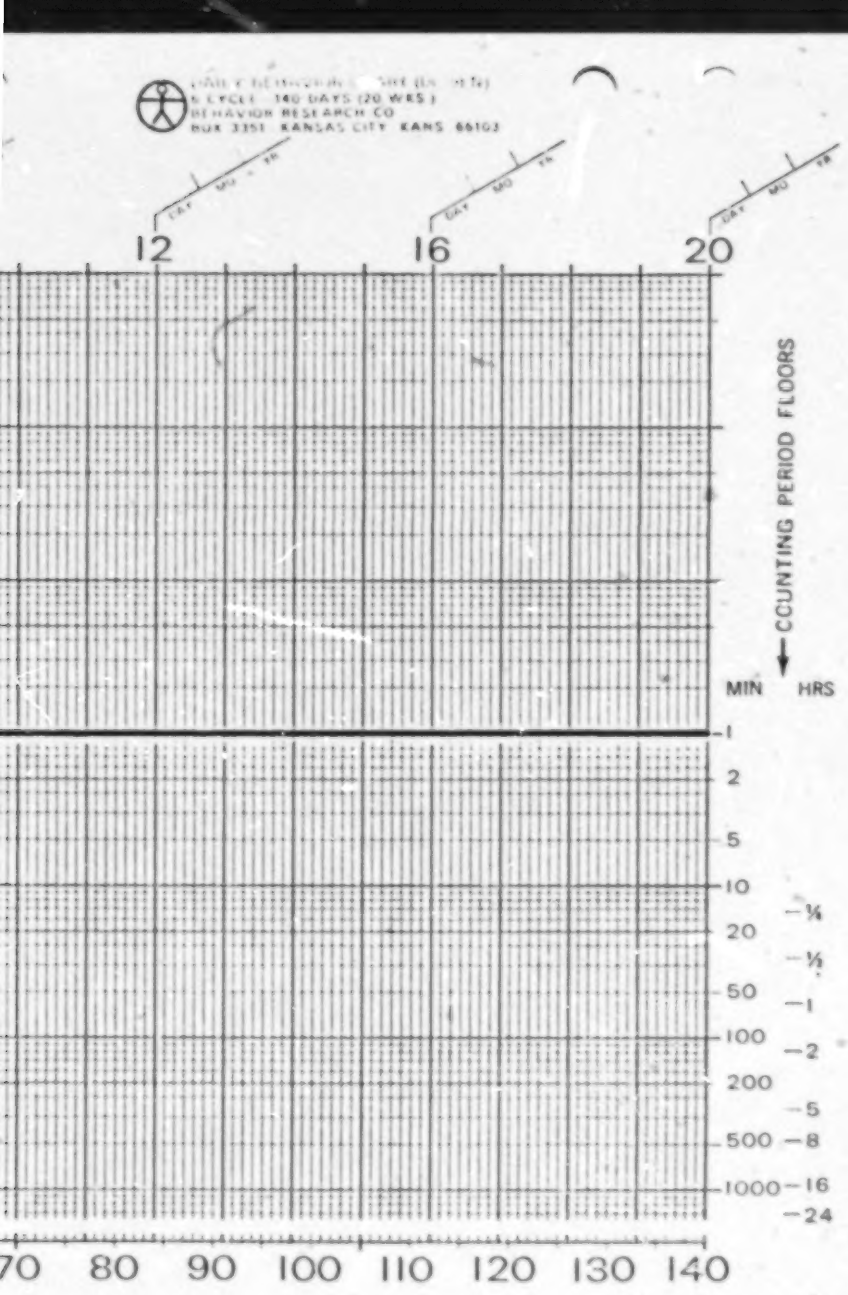
DEPOSITOR AGENT



ENDAR DAYS

Nikki 4 Student Cooperative Play
BEHAVER AGE LABEL COUNTED

R Bower R Bower Duration: On Task
COUNTER CHARTER

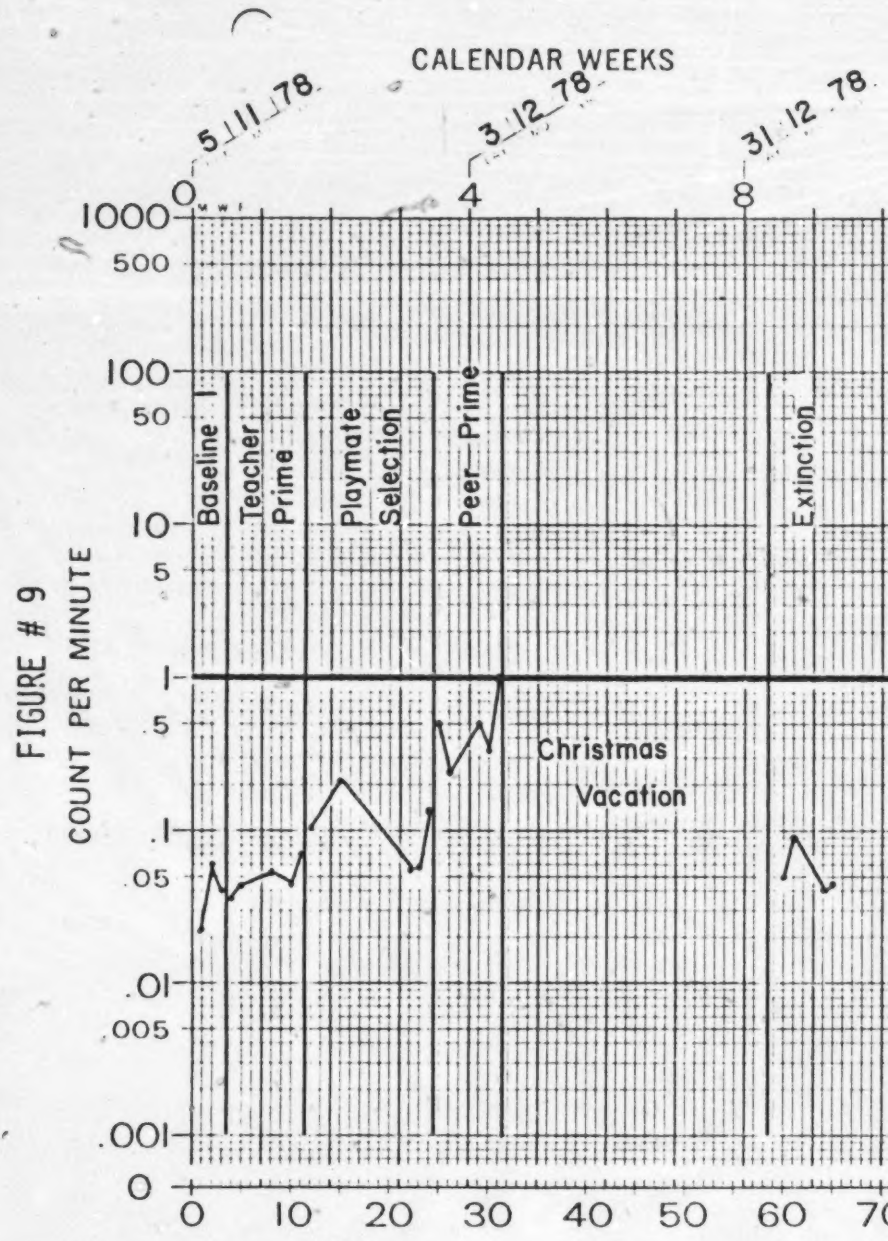
thematic play as duration levels ranged from .11 to a level above the criterion line during the recording period.

Figure 9 illustrates duration off task of cooperative thematic play. Observed duration events off task were unstable at levels ranging from .023 to .06 during Baseline. A slight acceleration trend can be noted regarding off task duration of cooperative thematic play during the Teacher Prime treatment phase. Duration levels during this phase ranged from .037 to ,07. Off task duration levels during Playmate Selection phase of the treatment were sporadic as observed levels ranged from .055 to .22. Off task duration levels accelerated during the Peer Prime treatment phase, illustrating less off task behavior than that observed during Playmate Selection or other phases. Off task duration levels of cooperative thematic play ranged from .25 to .5 during this phase of the treatment. Levels of off task duration decelerated noticeably during Extinction as a range of .04 to .09 is depicted for the recording period.

Discussion

The treatment-related data clearly demonstrate the efficacy of play equipment utilization and thematic play experiences in increasing desirable social interaction of a four-year-old female preschooler. Baseline data indicate that prior to treatment, the S did not play cooperatively or use peers' names. Only seldom did she touch peers or verbalize. The S's activities primarily consisted of solitary or parallel manipulation. Substantial improvement resulted in all treatment phases of the experiment.

Of particular interest to the experimenters was the effect of treatment on cooperative thematic play. Prior to this experiment, the S did



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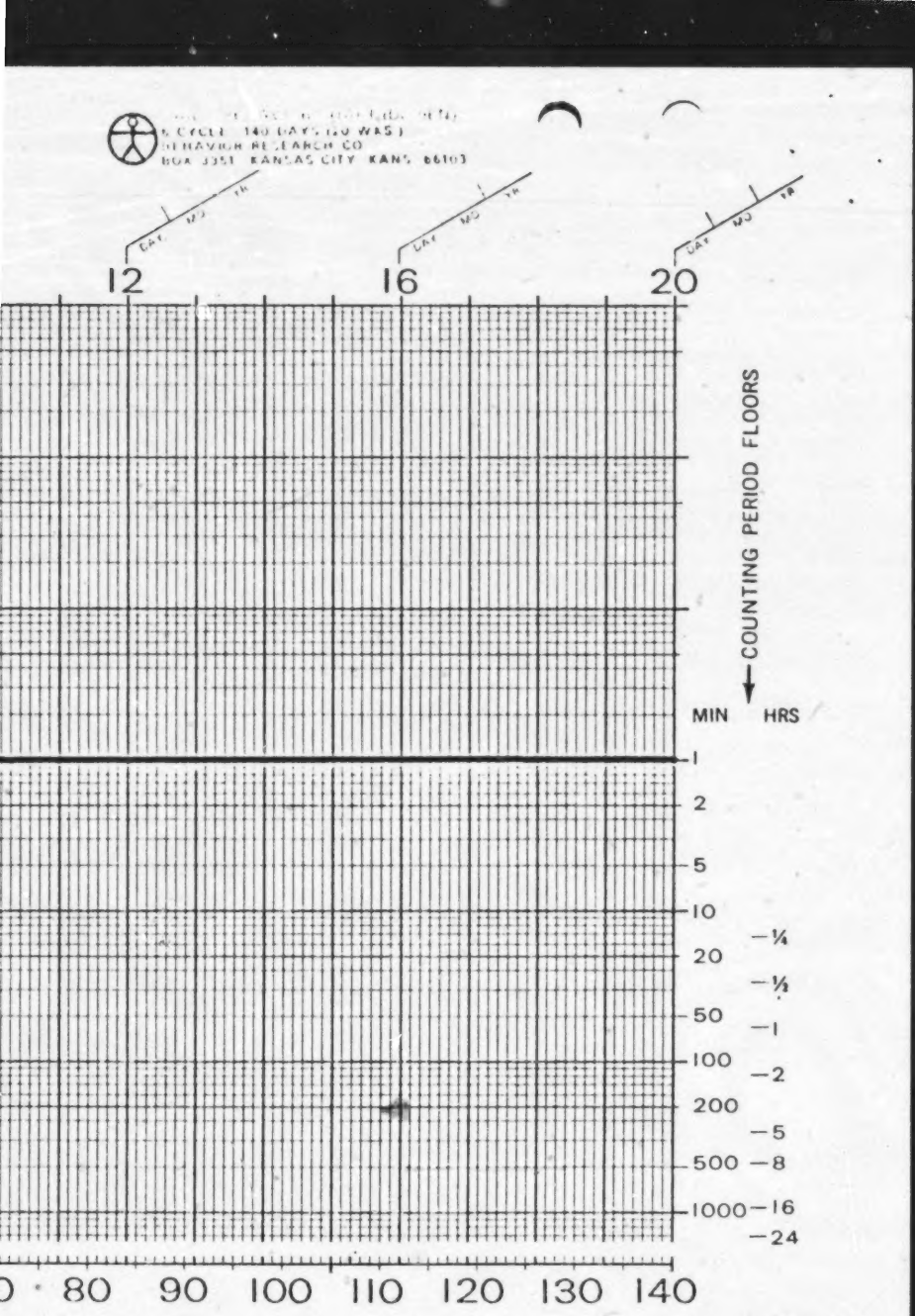
DEPOSITOR AGENCY



DAR DAYS

Nikki 4 Student Cooperative Play
BEHAVER AGE LABEL COUNTED

Bower R Bower Duration: Off Task
CHARTER

not exhibit this skill in her behavioral repertoire. Observation of graphic data indicate that as solitary play decelerated, cooperative construction accelerated. Cooperative construction eventually decelerated and was replaced and maintained by the hierarchial superior activity of cooperative thematic play.

Application of treatment procedures were pragmatic, inexpensive, and transferable to most preschool classroom situations. Social reinforcement consisting of verbal praise and touching, and priming can be used by any teacher or care-giver. Treats used to reward peers during the Peer Prime phase were easily accessible. Treatment procedures are also similar to naturally occurring behavioral consequences.

Christmas vacation provided an excellent opportunity to implement a reversal phase. As evidenced, the S's desirable play and social behaviors were extinguished in the absence of treatment procedures - - accenting the reliability of treatment effects. Plans for a long-range follow-up study are currently being made in order to reestablish and maintain these desirable behaviors in the absence of an experimenter-manipulated environment.

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